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10/584,407	06/26/2006	Paul Joseph Brooks	0076091-000008	9864

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EXAMINER	
KHATRI, PRASHANT J	

ART UNIT	PAPER NUMBER
1783	

NOTIFICATION DATE	DELIVERY MODE
06/10/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/584,407	BROOKS, PAUL JOSEPH	
	Examiner	Art Unit	
	PRASHANT J. KHATRI	1783	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 March 2011*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4,6-10,14-18,21,23 and 24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,6-10,14-18,21,23 and 24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

In response to Amendments/Arguments filed 3/23/2011. Claims 1, 4, 6-10, 14-18, 21, and 23-24 are pending. Claims 23 and 24 were added as new.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1, 4, 6-10, 14-18, 21, and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claims 1 and 23 recite the limitations of "high absorbency and emissive characteristics", "low absorbency characteristics", and "high transmissive characteristics". It is not clear what would be considered high or low in regards to the above material characteristics and in terms of the application for the film for an antenna. Claims 4, 6-10, 14-18, and 21 are further rejected as being dependent upon claim 1. Clarification is requested.

4. Claims 1 and 23 also recites the limitation that at 2.5 microns to 50 microns, the interference filter has high absorbency and emissive characteristics and also has low absorbency characteristics in the solar spectrum range from 200-2500 nm. Examiner notes that 2.5 microns is the same as 2500 nm. As such, it is not clear how at 2500 nm

or 2.5 microns, the film simultaneously has low absorbency and high absorbency.

Clarification is requested.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1, 4, 6, 9-10, 14, 21, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rogers et al. (***US 4479131***) in view of Jonza et al. (***US 5882774***) with evidence provided by 3M™ Radiant Mirror Film VM2000F1A6 Product Sheet (***Hereafter "Product Sheet"***).

7. Rogers et al. disclose a thermal protective shield for antenna reflectors. Concerning claim 1, Rogers et al. disclose that the thermal protective shield must be transparent to RF energy for example from 11-15 GHz, high solar reflectance which is about 54% and low absorption which is about 44%, high thermal emittance from the front or solar facing side, low thermal emittance from the back of the back or reflector facing side and low solar transmittance of about 2% through to the antenna (***col. 2, lines 44+***). The thermal protective shield is positioned in front of the RF transmitter or receiver by means of an adhesive or other conventional means (***FIG. 1; col. 2, lines 5+***). The conditions are met through several different embodiments including one embodiment (***FIG. 6***) that is a multilayered semiconductor optical coating that acts as an

interference filter to achieve different optical and thermal characteristics wherein the multilayered coating is disposed upon a polyimide substrate (***cols. 5-6, lines 59+***). While it is noted that Rogers et al. are silent to the solar spectrum range and IR range as presently claimed, the disclosure of Rogers of a multilayered semiconductor optical coating that tailored to achieve different optical and thermal characteristics would motivate one of ordinary skill in the art to design the appropriate optical stack that has the presently claimed characteristics. Examiner also notes that the solar radiation spectrum consists of five regions: IR, visible, UVA, UVB, and UVC wherein IR is further divided into IR-A, IR-B, and IR-C. As such, one of ordinary skill in the art would have been able to design a stack that is capable of reflecting and re-radiating in the presently claimed wavelength ranges. However, Rogers et al. are silent to the use of a metal-free thermal control film.

8. Jonza et al. disclose a multilayer optical film (***abstract***). Concerning claims 1, 4, and 6 Jonza et al. disclose the multilayer optical film allows for construction of mirrors and polarizers wherein said multilayer optical film are comprised of alternating layers of PEN and coPEN wherein the PEN and coPEN for example, and have different refractive indices (***FIG. 1b; col. 2 bridged to 3, lines 63+; col. 5, lines 28+; col. 10-12, lines 31+***). Examiner notes that the desired refractive index relation ships can be established by combining a first material that is crystalline or semi-crystalline with a second material that is crystalline, semi-crystalline, or amorphous by stretching during or after film formation, extruding, or coating (***col. 16-17, lines 39+***).

Jonza further discloses that optical properties such as reflectance and polarization vary depending upon the stretching as the stretching goes from uniaxial to biaxial stretching (***col. 3, lines 1+; col. 5, lines 28+; col. 10-12, lines 31+***). Specifically, it is noted that Jonza discloses stretch rate, stretch ratio, and stretch temperature are among the variables that one of ordinary skill in the art could adjust to form the desired optical properties (***col. 18, lines 1+***).

Regarding claim 4, it is noted that since the material as disclosed by Jonza is comprised of the materials as presently claimed in claim 1 (i.e. alternating high/low refractive indices non-metallic layers), the material would be intrinsically flexible. Concerning claims 9-10, Examiner notes that optical properties are known within the art to be strongly influenced by optical thicknesses which is a parameter based upon the physical thickness of each layer. Given the above disclosure, one of ordinary skill in the art by routine experimentation would be able to determine the thickness of the total stack depending upon the desired optical characteristics. See *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Thus, it would have been obvious to one of ordinary skill in the art to form the appropriate thickness depending upon the desired optical properties.

As evidence by the Product Sheet which discloses a mirror film that is comprised of a film that is similar to that used in the present invention and in Jonza and has wavelength transmission in the near wavelength range as that used in the present invention and an optical reflectivity in the visible light above 95% (***Table***). The mirror film is metal free and thus is non-corroding and non-conductive (***Table***). While it is

noted that the mirror film of the Product Sheet is silent to some of the presently claimed material characteristics, it is noted that the disclosure of Jonza explicitly recites that optical properties are dependent upon the processing and optical thickness parameters. As such, it is clear that one of ordinary skill in the art, in order to produce the desired optical performance of a mirror film, would by routine experimentation have produced the presently claimed material properties depending upon the application. See *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Concerning the present limitation of the film stack allowing heat to be dissipated, it is noted that since the combined disclosure appears to be the same as that presently claimed, the film would intrinsically allow for heat to be dissipated by means of the active face. The resultant film as shown by Jonza is metal-free and would thereby meet the limitations of claim 1.

Concerning claim 21, it is noted that the application of a liquid coating to form the film stack is considered a product-by-process given that the resultant film forms a multilayer stack wherein the material limitations can be met by either process. Although Jonza et al. does not disclose applying the interference stack as a liquid onto the substrate, it is noted that "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process", *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Further, "although produced by a different process, the burden shifts to applicant to

come forward with evidence establishing an unobvious difference between the claimed product and the prior art product", *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir.1983). See *MPEP 2113*.

Therefore, absent evidence of criticality regarding the presently claimed application as a liquid coating and given that Jonza meets the requirements of the claimed composite, Jonza clearly meet the requirements of present claim 21. Concerning claim 24, it is noted that Figure 1b shows the interference effects that occur at the interface between high and low refractive index layers. Further, it is noted that optical modeling and different designs are possible based upon the desired end use and optical performance needed wherein there are several equations that can be satisfied (***cols. 7-16***).

9. All of the elements were known within the art. The only difference is a single disclosure containing all of the presently claimed elements. Rogers et al. disclose a thermal protective shield for antenna reflectors. However, Rogers et al. are silent to the use of a metal-free thermal control film. Jonza et al. disclose a multilayer optical film that can be used in constructing mirrors containing only polymeric material. The mirrors are formed by varying the stretch ratio (i.e. uniaxial stretching to biaxial stretching), set temperatures, and other known parameters to form the desired optical performance properties. While it is noted that the mirror film of the Product Sheet is silent to some of the presently claimed material characteristics, it is noted that the disclosure of Jonza explicitly recites that optical properties are dependent upon the processing and optical thickness parameters. As such, it is clear that one of ordinary skill in the art, in order to

produce the desired optical performance of a mirror film, would by routine experimentation have produced the presently claimed material properties depending upon the application and thereby allow for heat to be dissipated. Further, it is noted that such a mirror film is metal free and thus, will not corrode in corrosive environments. Given that the multilayer stack of Rogers et al. serves as a interference stack for controlling the thermal and optical characterstics of the shield and Jonza with evidence from the Product Sheet disclosing a polymer stack that can be formed into a mirror film that reflects certain wavelengths, it would have been obvious to one of ordinary skill in the art to substitute the interference film of Jonza with the interference film of Rogers et al. in order to increase resistance to corrosion while maintaining the desired optical properties.

10. Claims 7-8 and 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rogers et al. (***US 4479131***) in view of Jonza et al. (***US 5882774***) with evidence provided by 3M™ Radiant Mirror Film VM2000F1A6 Product Sheet (***Hereafter "Product Sheet"***) as applied to claims 1 and 14 above, and further in view of Iacovangelo et al. (***US 6587263***).

11. Rogers et al. and Jonza disclose the above; however, prior art is silent to the filter comprising a silicon-based material.

12. Iacovangelo et al. disclose optical solar reflectors comprising a substrate, bond layer coating, reflective coating, and radiative layer (***abstract***). Concerning claims 7-8 and 15-16, Iacovangelo et al. disclose the radiative layer is comprised of silicon oxide,

silicon nitride, and silicon oxynitride in which the refractive index profile can be modulated to control the amplitude, bandwidth, and wavelength of the rejection bands (***abstract; col. 2, lines 35+***). The thickness of this layer is from 10 to 25 microns (***col. 2, lines 41+***). As shown by Iacovangelo, the radiative layer allows for improved emissivity and absorbency in wavelengths from 200 nm to 2500 nm and far infrared regions (***col. 2, lines 42+***). Regarding the limitation of a plurality of tiles, Iacovangelo et al. disclose the radiative layer is deposited to plates having a reflective layer used in spacecrafts (***col. 4, lines 50+***). The radiative layer comprising such materials allows for improved interfacial CTE matching during thermal cycling, improved optical performance at different wavelengths, and thermal properties (***col. 2, lines 35+***).

13. All of the elements were known in the art. The only difference is a single disclosure containing all of the presently claimed elements. Rogers et al. and Jonza disclose the above; however, prior art is silent to the filter comprising a silicon-based material. Iacovangelo et al. disclose optical solar reflectors comprising a substrate, bond layer coating, reflective coating, and radiative layer. Given that Iacovangelo et al. disclose the radiative layer comprising silicon oxide, silicon nitride, and silicon oxynitride has improved optical performance in certain wavelengths during thermal cycling, it would have been obvious to one of ordinary skill in the art to use the materials of Iacovangelo et al. in order to improve optical performance in the desired wavelengths.

Response to Arguments

~~14.~~ Applicant's arguments filed 3/23/2011 have been fully considered but they are not persuasive. Concerning the 35 USC 112, 2nd rejection of claims 1, 4, 6-10, 14-18, and 21, Applicant asserts that the '263 patent cited in the background sets forth what is considered "high" and "low" with respect to emissivity, absorbency, etc. It is noted the material in the '263 patent is not the same as that presently claimed since . Given that the materials in the '263 patent are metals and metalloids having different refractive indices than the polymeric materials preferred in the present invention, it is not clear whether these values would be able to correlate to the present invention. Examiner notes that no examples have been shown that the Applicants have achieved comparable values to the prior art which were clearly shown by the '263 patent. Examiner also notes that the substrates upon which the coatings in the '263 patent are disposed are metallic and non-transparent whereas the present invention is drawn towards solely transparent substrates which would be markedly different. As such, the rejection is maintained.

Concerning the art rejection, Applicant asserts that Rogers is silent to an antenna having an active face and a thermal film. Examiner respectfully disagrees and notes that the title explicitly discloses that the multilayer film is a thermal protective film for antenna reflectors. As such, the antenna is implicitly included and the active face is disposed in front of the RF transmitter (***FIGS. 1 and 2; col. 2, lines 6-68, col. 3, lines 1-60***). As such, it is not clear what Applicant is asserting given that the entire disclosure is drawn to a solar protector for an RF antenna wherein the solar protector is disposed

on the active face (***See FIGS. 1 and 2***). Applicant further asserts that "neither Jonza nor the 3M Product Sheet provides motivation to modify such a film to an active face". Examiner notes that polymeric films having alternating high/low refractive indices are known within the art for thermal control purposes (***See previously cited Russell 6391400***). Given that Jonza and the 3M Product show that one of ordinary skill in the art can design the same type of film as producing different optical effects based upon the wavelength, it is clear that one of ordinary skill in the art would have been able to design an optical stack as presently claimed.

Examiner also notes that metals are known within the art to corrode based upon the electrochemical potential differences between the metal and the environment said metal is placed in. As such, common sense would lead one of ordinary skill in the art to produce a non-metallic film in order to substitute the multilayer metal film of Rogers with that of Jonza and the 3M Product Sheet in order to combat the effects of corrosion. Furthermore, it is noted that the 3M Product Sheet explicitly recites the motivation of such films being metal-free and therefore non-corroding/non-conductive. Examiner notes that Applicant has admitted that such films are known, commercially available, and further customized to the precise specifications (***para. 0038-0039 of PG-Pub***). Therefore, substituting a metal multilayer film with a polymer film would have been well within one of ordinary skill in the art. As such, the rejections are maintained.

Conclusion

15. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PRASHANT J. KHATRI whose telephone number is (571)270-3470. The examiner can normally be reached on M-F 9:00 A.M.-5:00 P.M. (First Friday Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Sample can be reached on (571) 272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David R. Sample/
Supervisory Patent Examiner, Art Unit 1783

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Examiner
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